

Appl. No. 10/675,912
Am't. Dated: September 20, 2006
Reply to Office Action of June 20, 2006

Attorney Docket No. 81864.0025
Customer No. 26021

RECEIVED
GENERAL FAX CENTER

SEP 20 2006

REMARKS

This application has been carefully reviewed in light of the Office Action dated June 20, 2006. Claims 1-6, 8-9 and 11 remain in this application. Claims 1 and 8 are the independent Claims. Claims 1, 8 and 11 have been amended. Claims 7 and 10 have been canceled without prejudice. It is believed that no new matter is involved in the amendments or arguments presented herein. Reconsideration and entrance of the amendment in the application are respectfully requested.

Response to Arguments

In response to the Office Action's comments, regarding the previously presented arguments, starting on page 4, paragraph 5 Applicants respectfully submit that Figs. 2 and 9 are not contradictory. Alloys Nos. 58 and 66, as shown in Fig. 9, are comparative examples. Alloys No. 58 and 66 have their CV value exceed 130 because their sintering temperatures, at 1150° C, were too high. To obtain a CV value of 130 or less, adding Zr to a low-R alloy and sintering temperature are both important. Accordingly, the data presented in Figs. 2 and 9 do not contradictory. (See, Specification, page 29, line 23 – page 30, line 9; page 31, lines 18-25)

Art-Based Rejections

Claims 1-11 were rejected under 35 U.S.C. § 102(b) over E.P. Patent No. EP 1 164 599 A2 (Yamamoto), or in the alternative, under § 103(a) over the same. Applicants respectfully traverse the rejections and submit that the claims herein are patentable in light of the clarifying amendments above and the arguments below.

Appl. No. 10/675,912
Amtd. Dated: September 20, 2006
Reply to Office Action of June 20, 2006

Attorney Docket No. 81864.0025
Customer No. 26021

The Yamamoto Reference

Yamamoto is directed to an R-Fe-B based permanent magnet. An example of a permanent magnet as taught by Yamamoto has an overall composition of 29.5Nd-0.9Tb-balance Fe-3.2Co-1.0B-0.2Al-0.1Cu-XZr (where X is 0 or 0.11). After sintering the permanent magnet is heat-treated at 500°C for 1 hour. Yamato, in Table 3, also discloses that such a composition has a Br ranging from 13.58-13.66 and an iHc ranging from 13.1 to 14.1. Yamamoto also discloses a special two alloy process for making an R-Fe-B based permanent magnet. (See, *Yamamoto*; page 7, paragraph 67 - page 9, paragraph 75; page 8, example 3-3)

The Claims are Patentable over the Cited References

The present application is generally directed to an R-T-B system rare earth permanent magnet having a sintered body.

As defined by amended independent Claim 1, an R-T-B system rare earth permanent magnet including a sintered body with a composition 25% to 35% by weight of R, (R represents one or more rare earth elements, providing that the rare earth elements include Y), 0.5% to 4.5% by weight of B, 0.02% to 0.6% by weight of Al and/or Cu, 0.03% to 0.25% by weight of Zr, 4% or less by weight (excluding O) of Co, and the balance substantially being Fe. A coefficient of variation (CV value) showing the dispersion degree of Zr in the sintered body is 130 or less. The magnet also satisfies the condition that a residual magnet flux density (Br) and a coercive force (HcJ), Br + 0.1 x HcJ (dimensionless) is 15.2 or greater.

Yamamoto does not disclose or suggest the above features of the present invention as defined by amended independent Claim 1. In particular, Yamamoto does not disclose or suggest, "said magnet satisfies the condition that, with regard to

Appl. No. 10/675,912
Am't. Dated: September 20, 2006
Reply to Office Action of June 20, 2006

Attorney Docket No. 81864.0025
Customer No. 26021

a residual magnetic flux density (Br) and a coercive force (HcJ), $Br + 0.1 \times HcJ$ (dimensionless) is 15.2 or greater", as required by that claim.

Yamamoto's example 3-3 discloses a permanent magnet that has a composition as defined by amended independent Claim 1. However, the Yamamoto magnet was prepared by adding Zr to a high-R alloy. The resulting magnet had a maximum flux density of 13.61 and a maximum coercive force of 14.1, such that $Br + 0.1 \times HcJ = 15.07$. Yamamoto's examples 3-1, 3-2 and 3-4 all have a Zr amount and a Co amount higher than in the present claim 1. In addition, after completion of the sintering, the obtained sintered body may be advantageously subjected to a two step aging treatment in the present application, whereas Yamamoto adopts a single step heat-treating process. For example, Yamamoto's example 3-3 was subject to a single step heat-treating process at 500°C for 1 hour. (See, Yamamoto; page 7, paragraph 67 - page 9, paragraph 75; page 8, example 3-3)

Applicants respectfully submit that the combination of the present application's composition and production method is not taught or suggested by Yamamoto. The present application's combination leads to a good Zr dispersion and results in high magnetic properties regarding a residual magnetic flux density (Br) and a coercive force (HcJ), such that $Br + 0.1 \times HcJ$ is 15.2 or more. (See, Specification, page 19, line 12 - page 20, line 3).

Moreover, Applicants respectfully resubmit that Yamato fails to teach or suggest "An R-T-B system rare earth permanent magnet...wherein a coefficient of variation (CV value) showing the dispersion degree of Zr in said sintered body is 130 or less", as required by amended independent Claim 1, for at least the same reasons as those submitted in Applicants' April 14, 2006 response. As discussed above, the Office Action the data represented in Figs. 2 and 9 are consistent, as the present claims are not directed to a method, but to compound for a magnet. Accordingly,

Appl. No. 10/675,912
Amtd. Dated: September 20, 2006
Reply to Office Action of June 20, 2006

Attorney Docket No. 81864.0025
Customer No. 26021

Yamamoto fails to teach or suggest "*An R-T-B system rare earth permanent magnet...wherein a coefficient of variation...is 130 or less*" as required by that claim.

Since Yamamoto fails to disclose, teach or suggest the above features recited in independent Claim 1, the reference cannot be said to anticipate or render obvious the invention which is the subject matter of that claim.

Accordingly, independent Claim 1 is believed to be in condition for allowance and such allowance is respectfully requested.

Regarding amended independent Claim 8, Applicants respectfully submit that Yamamoto does not disclose or suggest features of the present invention as defined by that claim. In particular, Yamamoto does not teach or suggest, "...*a grain boundary phase containing a higher amount of R than said main phase... and said compound for magnet comprises a mixture of an alloy for formation of said main phase and an alloy for formation of said grain boundary phase, wherein Zr and Cu is contained in said alloy for formation of said main phase*", as required by amended independent Claim 8.

In examples 3-1 thru 3-4, Yamamoto discloses a mother ally and an auxiliary alloy used in the two alloy process, wherein the amount of R is higher in the auxiliary alloy than it is in the mother alloy. In each of the examples the auxiliary alloy contains both Zr and Cu, while the mother alloy contains only Zr.

By disclosing that a mother alloy both contains a lesser amount of R than the Yamamoto auxiliary alloy, but does not contain Cu, Yamamoto fails to teach or suggest "...*a grain boundary phase containing a higher amount of R than said main phase ... wherein Zr and Cu is contained in said alloy for formation of said main phase*" as required by amended independent Claim 8.

Since Yamamoto fails to disclose, teach or suggest the above features recited in amended independent Claim 8, these references cannot be said to anticipate or render obvious the invention which is the subject matter of that claim.

Appl. No. 10/675,912
Am't. Dated: September 20, 2006
Reply to Office Action of June 20, 2006

Attorney Docket No. 81864.0025
Customer No. 26021

Accordingly, amended independent claim 8 is believed to be in condition for allowance and such allowance is respectfully requested.

The remaining claims depend either directly or indirectly from independent Claims 1 and 8, and recite additional features of the invention which are neither disclosed nor fairly suggested by the applied references and are therefore also believed to be in condition for allowance, and such allowance is respectfully requested.

Applicant believes the foregoing amendments comply with requirements of form and thus may be admitted under 37 C.F.R. § 1.116(b). Alternatively, if these amendments are deemed to touch the merits, admission is requested under 37 C.F.R. § 1.116(c). In this connection, these amendments were not earlier presented because they are in response to the matters pointed out for the first time in the Final Office Action.

Lastly, admission is requested under 37 C.F.R. § 1.116(b) as presenting rejected claims in better form for consideration on appeal.

Conclusion

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6809 to discuss the steps necessary for placing the application in condition for allowance.

Appl. No. 10/675,912
Am't. Dated: September 20, 2006
Reply to Office Action of June 20, 2006

Attorney Docket No. 81864.0025
Customer No. 26021

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

Date: September 20, 2006

By:



Dariush G. Adli
Registration No. 51,386
Attorney for Applicant(s)

500 South Grand Avenue, Suite 1900
Los Angeles, California 90071
Phone: 213-337-6700
Fax: 213-337-6701